

BRODSKIY, A. A.

Expediency of using hydrochemical prospecting in mountain regions. Sov. geol. 5 no.10:136-139 0 '62.

(MIRA 15:10)

(Geochemical prospecting)

BRODSKIY, A.A. [deceased]; TOKAREV, A.N., red.

[Fundamentals of hydrogeochemical prospecting methods for sulfide deposits.] ~~Osnovy gidrogeokhimicheskogo metoda poiskov sul'fidnykh mestorozhdenii.~~ Moskva, Izd-vo "Nedra," 1964. 257 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skiy institut gidrogeologii i inzhenernoi geologii. Trudy, no.12)

AW 11/1

PRODSKY, H.B.

AI-6. *Janet theory thermodynamics*

Calculation of the composition of equilibrium gas mixtures at high pressures. A. B. Brodskii (*Acta Physicochim. U.R.S.S.*, 1942, 17, 223-229).—The equation given previously (A., 1944, I, 103) for the activity coeff. of a gas is a mathematical expression of the results of Newton and Dodge (A., 1935, 222). Calc. vals. for the yields of NH_3 from N_2 and H_2 at 300–600 atm. agree well with observed vals.
J. F. H.

ERODSKIY, Aleksandr Davidovich; KUZ'MENKO, Vladimir Kuz'mich;
SOLOV'YEV, Vladimir Ivanovich; NESTEROV, N.P., inzh.,
retsenzent; POPILOV, L.Ya., inzh., retsenzent; SOLOV'YEV,
V.I., nauchn. red.; SMOIEV, B.V., red.

[Modern physical and technical methods in shipbuilding]
Sovremennye fiziko-tekhnicheskie metody v sudostroenii.
Leningrad, Izd-vo "Sudostroenie," 1964. 188 p.
(MIRA 17:7)

BRODSKIY, A.D.

~~Electrostatic calibration method of capacitor microphones in~~
small-size chambers. Trudy VNIIM no.13:100-104 '53. (MIRA 11:6)
(Microphone) (Calibration)

BRODSKIY, A.D.; KAN, V.L.

Increasing the sensitivity of Rayleigh disks. Izv.tekh. 20 no.1:
56-57 Ja '59. (MIRA 11:12)

(Sound—Measurement)

BRODSKIY, A.D.; KAN, V.L.; PYATIGORSKIY, L.M., nauchnyy red.;
KUZNETSOVA, M.I., red. izd-va; KASHIRIN, A.G., tekhn.
red.

[Brief manual on mathematical processing of measurement
results] Kratkii spravochnik po matematicheskoi obrabotke
rezul'tatov izmerenii. Moskva, Gos. izd-vo standartov,
1960. 167 p.
(MIRA 14:5)

- ✓1. Vsesoyuznyy nauchno-issledovatel'skiy institut metro-
logii im. D.I.Mendeleyeva (for Brodskiy, Kan)
(Probabilities)

S/115/60/000/05/13/034
B007/B011

AUTHORS: Brodskiy, A. D., Savateyev, A. V.

TITLE: A New Method of Measuring Absolute Temperature²¹

PERIODICAL: Izmeritel'naya tekhnika, 1960, No. 5, pp. 21-25

TEXT: A new method of temperature measuring is described here. It is based on the amplitude discrimination and on the calculation of the number of voltage pulses of thermal noise which depends on the absolute temperature of the resistor. A relation is derived between the absolute temperature and the number of pulses per unit time with known threshold of the discrimination. The method shown here allows, in principle, for temperature to be measured in a wide range. Theoretically, the sensitivity of this method rises with dropping temperature. The paper under review is a provisional communication on the possibility of using the method under discussion for the measurement of thermodynamic temperature, and contains no estimation of the respective accuracy. There are 4 figures and 7 references: 2 Soviet, 4 English and 1 German.

Card 1/1

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84654

S/115/60/000/010/012/028
B021/B058

AUTHORS: Brodskiy, A. D. and Filandrov, G. N.

TITLE: Application of Freon¹ for Testing Instruments in the
Low-temperature Field

PERIODICAL: Izmeritel'naya tekhnika, 1960, No. 10, p. 36

TEXT: Spirit cryostats cooled by means of liquid oxygen or nitrogen are usually applied for conducting State examinations of various thermometers and thermocouples in the temperature range of from 0 to -100°C. For obtaining temperatures below -100°C, butane propane and pentane respectively are used instead of spirit, which are, however, explosive. In this connection, the laboratoriya nizkikh temperatur (Laboratory of Low Temperatures) of the VNIIM (Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii (All-Union Scientific Research Institute of Metrology)) studied the possibility of using the chemically inert and harmless gas Freon. The technical data of some Freons manufactured by the Soviet industry are tabulated:

Card 1/2

Application of Freon for Testing Instruments
in the Low-temperature Field

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B021/B058

Freons	Type Designation	Boiling Point (°C)	Melting Point (°C)
Freon-12	F-12	-29.8	-155.0
Freon-13	F-13	-81.5	-180.0
Freon-14	F-14	-127.9	-184.0
Freon-22	F-22	-40.8	-160.0

The authors used Freon-12 as coolant and compared specimen resistance thermometers of the P. G. Strelkov type in the conventional liquid cryostat of the Henning type at temperatures of -41.9; -62.6; -69.6; -105.9; -131.8°C. The test can be made in the conventional Dewar flask if special cryostats are lacking. Mixtures with a given boiling point can be obtained by mixing various types of Freons. Boiling- and melting point of Freon are determined by means of specimen resistance thermometers and thermocouples respectively. Freon is described as being rather expensive at present. There is 1 table.

Card 2/2

24108

S/196/61/000/006/003/014

E073/E535

24,5600 (1482, 1537, 1137)

AUTHORS: Brodskiy, A.D., Kremlevskiy, V.P., Savateyev, A.V.

TITLE: New methods of realizing the thermodynamic scale in the range of low temperatures

PERIODICAL: Referativnyy zhurnal, Elektrotehnika i energetika, 1961; No.6, pp.3-4, abstract 6G23. (Tr. in-tov Kom-ta standartov mer i izmerit. priborov pri Sov. Min. SSSR, 1960, Issue 49, (109), 24-29)

TEXT: The paper deals with work on realizing a thermodynamic scale at low temperatures by the method of an electroacoustic gas thermometer and the method of counting thermal noise voltage pulses. Realization of the thermodynamic temperature scale by means of the electroacoustic gas thermometer is based on the dependence of the temperature of the resonant frequency of the oscillations of the sound wave in an acoustic tubular resonator. The realization by means of a thermal noise thermometer is based on the temperature dependence of the number of noise voltage pulses, the amplitude of which exceeds a given discrimination threshold. In the applied methods, measurement of the temperature is realized by means of

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New methods of realizing the ...

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frequency measuring instruments, as a result of which a high sensitivity is achieved which increases with decreasing temperature. Basic circuits are given for both systems and also the results of measuring the boiling temperature of hydrogen and oxygen. It is pointed out that although the obtained results are in good agreement with the data of the international temperature scale, they are preliminary, since the influence of systematic errors on the measured results has not been adequately studied. Work is continuing on improving the accuracy of the thermodynamic temperature scale in the range 4-273°K by means of the electroacoustic gas thermometer and the thermal noise thermometer methods and work is also continuing on stabilizing the temperature field and excluding systematic errors. 3 references.
Abstracted by L. Boronina.

[Abstractor's Note: Complete translation.]

Card 2/2

31029

S/573/61/000/005/021/023
D201/D305

9.8300
9.8200

AUTHORS: Brodskiy, A.D., and Kovalevskaya, V.V.

TITLE: Acoustic thermometer for telemetry

SOURCE: Akademiya nauk SSSR. Institut elektromekhaniki.
Sbornic rabot po voprosam elektromekhaniki.no. 5,
Moscow, 1961. Avtomatizatsiya, telemekhanizatsiya
i priborostroyeniye, 281 - 287

TEXT: In the present article a description is given of the construction and operation of a telemetering temperature to frequency converter designed by the authors, in the form of a cylindrical resonator and a head with the associated circuitry. The electric circuit consists of two microphones, an electrodynamic system and a transistorized amplifier (the transistorized amplifier has been designed by V.K. Potapkin). Audio oscillations are induced in the resonator by one microphone and received by the other. The resonant frequency of the thermometer is given by the resonant frequency of the resonator

Card 1/4

Acoustic thermometer for telemetry

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$$f = \frac{c}{\lambda} = \frac{c}{2L}, \quad (1)$$

where c - velocity of sound, L - length of the resonator. From the laws of thermodynamics and taking into account the linear expansion coefficient of the resonator and the second virial coefficient B , the temperature is related to frequency by

$$T = \frac{\gamma(1 + \alpha t)^2}{\gamma} \cdot \left[\frac{f}{f_0} \left(T_0 + \frac{2B_0 p_0}{R} \right) - \frac{2B_p}{R} \right],$$

in which T - the absolute temperature, R - universal gas constant, γ - ratio of gas thermal capacities, M - molecular weight of the gas, p - gas pressure. The practically obtained $f = F(t)$ is very linear from -40 to +40°C owing to mutual cancellation of some of the non-linearity factors. The microphones are connected to the input and output of the amplifier forming with it an acoustic feedback oscillator. If there is an additional phase shift between the frequency of the oscillator (f_0) and that of resonator (f_{res}), an

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Acoustic thermometer for telemetry

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error arises given by

$$\frac{\Delta f}{f_0} = \frac{\Delta \varphi}{2Q} \cdot \frac{1}{\cos^2 \Delta \varphi} \approx \frac{\Delta \varphi}{2Q} \quad (5)$$

where Q - the quality factor of the resonator and $\Delta \varphi$ the additional phase shift. The resonator of the model No. 1 thermometer was filled with dry air. The calculated frequency from formula (1) was 1000 c/s. Using amplifier No. 5 the frequency determined experimentally was $f_0 = 1030.12 \pm 0.02$ c/s sensitivity at T_0 and f_0 was $S_f \approx 1.9$ c/°C. The maximum difference between theoretical and experimentally obtained values of temperature was 0.51° . The analytical expression for temperature against frequency curve (found in practice to be nearly linear) has been found to be $t_p = 0.572f_x - 589.16^\circ$. At present some additional evaluation of the instrument is proceeding to determine the measurement errors. It is stated in conclusion that the acoustic thermometer as applied for telemetering has the following advantages: 1) The temperature is measured by frequency measurement methods; 2) It is calibrated at two points

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Acoustic thermometer for telemetry

³¹⁰²⁹
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D201/D305

only; 3) It can be used for long distance temperature data transmission. Its main disadvantages are the need for very good resonator hermetic sealing and the requirement of phase characteristics of the electro acoustic circuit. It is thought that in future it would be possible to produce acoustic thermometers using electrodynamic transducers type MTA-1-59 (MTD-1-59) instead of the previous MTD-1 systems used by the authors. There are 3 figures and 1 table. +

Card 4/4

23468

S/115/61/000/006/004/006
E073/E535

9,6110
AUTHOR:

also 105,1203
Brodskiy, A. D.

TITLE:

Electro-acoustic Gas Thermometer for the Low
Temperature Range

PERIODICAL: Izmeritel'naya tekhnika, 1961, No.6, pp.22-24

TEXT: A new method of determining the temperature was developed by the author. It is based on measuring the frequency of oscillations of a sound wave in an acoustic tube resonator, which forms a part of a generator of electromagnetic oscillations with acoustic feed-back. A basic property of such a generator is the dependence of the oscillation frequency on the temperature of the acoustic resonator. If the tubular resonator is filled with an "ideal gas" (chemically pure helium in the given case), it is possible to determine the speed of sound propagation at various temperatures by measuring the frequency of the oscillator. The accuracy of up-to-date methods of measuring the frequency is very high (of the order of 10^{-8}) and, consequently, the accuracy of measuring the thermodynamic temperature will also be high. The dependence of the speed of sound propagation C on the

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Electro-acoustic Gas Thermometer ... S/115/61/000/006/004/006
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absolute temperature T for an ideal gas can be expressed by

$$c = \sqrt{\frac{\gamma RT}{M}} \quad (1)$$

where $\gamma = c_p/c_v$ - ratio of the specific heats, R - gas constant, M - molecular weight. The resonance frequency of a tubular resonator of constant length is expressed by

$$f = \frac{c}{2L} \quad (3)$$

where f is the first resonance frequency, L - length of the resonator. From these, the following formula is derived for expressing the temperature

$$T_x = \left(\frac{f_x (1 + \alpha t)}{f_o} \right)^2 \left(T_o + \frac{2B_o P_o}{R} \right) - \frac{2B_x P_x}{R} \quad (6)$$

where the index x denotes the sought temperature, α is the

Card 2/4

Electro-acoustic Gas Thermometer ... ²³⁴⁶⁸ S/115/61/000/006/004/006
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coefficient of linear expansion of the resonator and the values with the index α apply to the temperature $T_0 = 273.16^\circ\text{K}$. The random errors in determining the thermodynamic temperature will be governed basically by the errors in measuring the frequency, which are negligible. If monatomic gases of insufficient chemical purity are used, it is necessary to introduce a correction relating to the temperature dependence of the specific heat. The electro-acoustic thermometer has an increased sensitivity in the low temperature range and the sensitivity increases sharply at temperatures approaching zero. A description is given of the electro-acoustic thermometer which was used by the authors for determining the boiling point of hydrogen. The sound oscillations were generated by means of telephone apparatus. The boiling point of hydrogen determined by this instrument was within 0.03° of the value determined by other authors by means of ordinary gas thermometry. The here given results are preliminary ones. At 20°K the sensitivity of the instrument was 15 c.p.s./deg. and the random error of the frequency for a measurement duration of 5 min was 0.5 c.p.s. Thus, the random measuring error did not exceed

Card 3/4

Electro-acoustic Gas Thermometer ... ²³⁴⁶⁸ S/115/61/000/006/004/006
E073/E535

+ 0.02°. The described electro-acoustic gas thermometer is intended for measuring thermodynamic temperatures in the range 273.5 to 10°K. There are 2 figures and 12 references: 6 Soviet-bloc and 6 non Soviet-bloc. The references to English-language publications read as follows: Mayer. On an acoustic pyrometer. Phil. Mag. 1873, XLV.18; Quigley. Phys. Rev., 1945, 67, 298; Barrett, E.W., Suomi, V.E. Journ. of Meteorol., 1949, 6, 273; Itterbeek, A. et al., Temperature Measurement with an Acoustical Thermometer, Bull. de Inst. International du Froid, 1958, No. 1.

Card 4/4

6.8000 (and 1063, 1155)

20239

S/046/61/007/001/010/015
B104/B204

AUTHORS: Brodskiy, A. D., Sergeyev, A. G.

TITLE: The use of the "ball method" for determining the piezo modulus of a crystal

PERIODICAL: Akusticheskiy zhurnal, v. 7, no. 1, 1961, 89-90

TEXT: The "ball method" suggested by Andreyev for measuring the amplitudes of small vibrations may be used for measuring the piezomodulus. For this purpose, the piezoplate 1 to be tested is glued onto a vibrating backing, whose vibration amplitude may be continuously changed. Onto the piezoplate a small metal ball 3 is placed, which is fastened by means of a horizontal arm. With increasing vibration amplitude, the ball begins to detach itself from the crystal at a certain value, and to jump. This detaching of the ball occurs, when the amplitude attains the value $x_0 = g/4\pi^2 f^2$, where g is the gravitational constant and f the frequency. At this amplitude, the mechanical strain in the crystal equals $P_0 = gm/2s$, where m is the mass of the crystal and S its surface. If the vibration amplitude is measured in this manner, the piezomodulus may be determined by means of formula $d = 2CU_0/mg$.

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The use of the ...

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B104/B204

Here, C denotes the capacity of the crystal and U_0 the electromotive force produced by the crystal. The accuracy of this determination of the piezomodulus depends on the accuracy of the capacity determination, on the determination of voltage on the plates, on determination of the weight of the plate and on the accuracy of determining that amplitude at which the ball begins to detach itself. Detaching of the ball is recorded most accurately by an oscilloscope, for, if its input connected to the piezocrystal, the curve on the screen represents the vibration amplitude as long as the ball is not detached. Thus, a sinusoidal oscillation is observed. However, as soon as the ball begins to be lifted, the signal is disturbed. This method simplifies the determination of the piezomodulus considerably, because a determination of the static charges of the crystal is not necessary. There are 1 figure and 1 table.

ASSOCIATION: Leningradskiy institut inzhenerov zh.-d. transporta im.
V. N. Obratstova (Leningrad Institute of Railroad Engineers
imeni V. N. Obratstov)

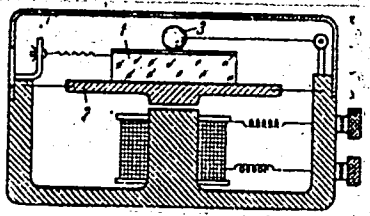
SUBMITTED: July 1, 1960

Card 2/3

The use of the

20239

S/046/61/007/001/010/015
B104/B204



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40393

S/081/62/000/013/018/054
B158/B144

245500

AUTHORS: Brodskiy, A. D., Truleva, I. B.

TITLE: The reproducibility of the boiling point of oxygen

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 13, 1962, 357, abstract 13I141 (Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR, no. 51 (III), 1961, 41-43)

TEXT: It has been established at VNIIM, after working on data on the reproduction of an international temperature scale at the boiling point of O_2 using standard platinum resistance thermometers (TS), that the mean quadratic error of the latter is $4 \cdot 10^{-3} ^\circ C$. These results are obtained by stabilizing the temperature field in an O_2 bath and using a special apparatus to obtain chemically pure O_2 . It is established that platinum TS are stable within the limits of reproducibility of the boiling point of O_2 , for which reason it is necessary to graduate the sample TS carefully by comparing with one of the standard TS graduated
Card 1/2

The reproducibility of the boiling ...

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B158/B144

previously at the boiling point of O_2 with the aid of a condensation thermometer. [Abstracter's note: Complete translation.]

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245500

S/589/61/000/051/001/008
1054/1254

AUTHORS: Brodskiy, A.D. and Savateyev, A.V.

TITLE: Noise impulse thermometer

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov.
Trudy institutov Komiteta. no. 51 (111). 1961. Issledovaniya
v oblasti temperaturnykh izmereniy. 110-115.

TEXT: A modified method of measurement of absolute temperatures is developed using the thermal noise in a resistance, by counting the number of noise impulses per unit of time. The range of measurement is wide, reaching from the point of the thermal destruction of the sensing element down to the region of super-conductivity. The sensitivity increases with decrease in temperature. Care taken to eliminate outside interferences to achieve stability of the equipment. Tests on liquid oxygen showed 0.2°C (average) discrepancy from the international temperature scale. There are 3 figures and 1 table. The English language reference is: Lawson, A.W., Long, A., Phys. Rev., v. 70, No. 3,4,1946, p. 220.

Card 1/2

Noise impulse...

S/589/61/000/051/001/008
I054/I254

ASSOCIATION: VNIIM

SUBMITTED: November 11, 1959

18

Card 2/2

BRODSKIY, A. D.; KREMLEVSKIY, P. P.; SAVATEYEV, A. V. (X)

"Nouvelles methodes de realisation d'une echelle thermodynamique dans le domaine des basses temperatures."

Report presented at the 6th Session of the Advisory Committee on Thermometry to the International Committee on Weights and Measures, Sevres, France, 25-27 Sep 62

Institut de Metrologie D. I. Mendeleev (U. R. S. S.)

> New Methods for Establishing a thermodynamic low temperature scale.

(2)

BRCDSKIY, A. D.; SOLOVYEV, V. I.

"Realisation des points-reperes de l'echelle de temperature
par la methode de la frequence quaripolaire nucleaire "
Report presented at the 6th Session of the Advisory Committee
on Thermometry to the International Committee on Weights and
Measures, Sevres, France, 25-27 Sep 62

Institut de Metrologie "I. Mendeleev (U. R. S. S.)

BRODSKIY, Aleksandr Davidovich; MYASNIKOV, L.L., prof., red.;
ALEKSANDROVA, N.N., red. izd-va; POL'SKAYA, R.G., tekhn.
red.

[New methods for measuring low temperatures] Novye metody
izmereniia nizkikh temperatur. Pod obshchei red. L.L.
Miasnikova. Moskva, Standartgiz, 1962. 131 p.
(MIRA 16:5)

(Thermometry) (Low temperature research)

42679

24.5500

S/589/62/000/063/020/021

9.8300

E192/E382

AUTHOR: Brodskiy, A.D.

TITLE: Radiofrequency methods of temperature-measurement

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta. no. 63(123). Moscow, 1962. Issledovaniya v oblasti teplovykh i temperaturnykh izmereniy, 225 - 229

TEXT: A converter of a bipole type can be designed for translating temperature variations into corresponding frequency changes. Such a converter is characterized by the conversion coefficient:

$$K = f/T$$

(3) .

Such temperature-frequency converters are advantageous in that the instruments employed at the output can have an accuracy of 10^{-9} or even better, the indication can be in digital form and telemetering can easily be introduced. One of the simplest converters is in the form of a relaxation oscillator based on a gas-discharge tube. The frequency of such an oscillator is given by: X

Card 1/3

Radiofrequency methods of

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$$f = \frac{1}{2.3 RC \ln \frac{U - U_{\text{ext}}}{U - U_3}} \quad (5)$$

where U_{ext} is the extinction voltage and U_3 is the ignition voltage of the tube. By analyzing Eq. (5) and assuming that R increases linearly with temperature, it is seen that the conversion coefficient is expressed by:

$$K = A/T^2 \quad (6)$$

A more satisfactory conversion is achieved by using the oscillator arrangement illustrated in Fig. 5, where the temperature-dependent resistance r_T is connected into a bridge circuit which forms the load of the resonant circuit of an LC oscillator. The sensitivity of such a device for temperature ranging from +20 to -4 °C can be as high as 0.001 °C. Converters can also be based on oscillators whose capacitive element is temperature-dependent due to its permittivity being a function of temperature. Barium titanate is

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Radiofrequency methods of

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a particularly sensitive dielectric. It is possible to produce a temperature-dependent inductance by using paramagnetic salts or ferromagnetics. In both these cases, the frequency will vary as a function of temperature and the conversion coefficient will be inversely proportional to the square root of the temperature. The sensitivity of such temperature-measuring devices is equal to the conversion coefficient K . There are 5 figures.

ASSOCIATION: VNIIM

SUBMITTED: February 13,
1961

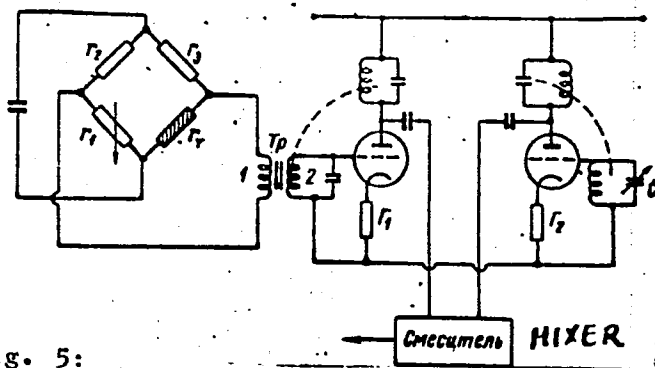


Fig. 5:

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S/589/62/000/063/021/021
E202/E492

AUTHORS: Brodskiy, A.D., Solov'yev, V.I.

TITLE: On the reproducibility of a temperature scale based on the nuclear quadrupole resonance

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta. no.63(123). Moscow, 1962. Issledovaniya v oblasti teplovykh i temperaturnykh izmereniy, 230-234

TEXT: The possibility of reproducing temperature scale by means of a standard thermometer based on the temperature dependence of the resonance frequency of a pure nuclear quadrupole splitting of levels is briefly described. The work was carried out in the Laboratoriya nizkikh temperatur (Low Temperature Laboratories) of VNIIM in 1960 and led to the development of a special radiospectrometer. The authors give the fundamental relations on which the action of the nuclear quadrupole resonance thermometer depends and discuss the merits of the super-regenerative oscillator-detector and the regenerative oscillator-detector. It is concluded from the authors own and other work that these relations may give high sensitivity in the Card 1/2

On the reproducibility ...

S/589/62/000/063/021/021
E202/E492

region $20 < T < 300^{\circ}\text{K}$, namely 0.002° at 273°K and 0.004° at 77°K .
Using the super-regenerative and regenerative circuits in their
radiospectrometers, the authors carried out preliminary studies
with paradichlorobenzol, sodium chlorate and potassium chlorate
as thermometric substances in the region of 198 to 294°K .
There are 2 figures. ✓

ASSOCIATION: VNIIM

SUBMITTED: January 26, 1961

Card 2/2

37801
S/120/62/000/002/026/047
E039/E435

24.5500

AUTHORS: Solov'yev, V.I., Brodskiy, A.D.

TITLE: An apparatus for measuring temperature by means of nuclear quadrupole resonance

PERIODICAL: Priory i tekhnika eksperimenta, no.2, 1962, 111-114

TEXT: The described apparatus ET-2 (ET-2) is used for temperature measurements at and above 77°K. It makes use of the dependence of nuclear quadrupole resonance (N.Q.R.) frequency on temperature. The basic equation for the interaction of the quadrupole moment of the nucleus with the internal fields in a crystal is given in the form of a Hamiltonian and from this is derived an expression for the temperature dependence of the N.Q.R. frequency. However, the theory is not adequate to provide an absolute measure of temperature and the apparatus was calibrated by means of a series of fixed points. In order to obtain a fast and simple means of measuring the N.Q.R. frequency, a special phase compensated radio-spectrometer circuit was developed, the circuit of which is described in detail. The essence of the phase compensation method is the production of an auxiliary (null) Card 1/2

An apparatus for measuring ...

S/120/62/000/002/026/047
E039/E435

impulse when the frequency of the signal in the circuit containing the sample corresponds with the frequency of a standard generator. Coincidence is obtained by changing the frequency of the standard generator. The error in comparative measurements is not more than 1 to 2 c/s. In the case of a thermometric substance with a temperature coefficient of N.Q.R. ~ 3 to 4 Kc/ $^{\circ}$ K (e.g. KClO_3) the error in temperature measurement is $\pm 0.001^{\circ}$ K. A block diagram of the apparatus together with essential circuits is given. The scanning head and resonator probe are also illustrated. With the aid of this apparatus an investigation of thermometric materials containing chlorine was conducted (e.g. NaClO_3 , KClO_3 , SbCl_3 , paradichlorobenzene, etc). A graph showing the temperature dependence of the N.Q.R. frequency for NaClO_3 and paradichlorobenzene is given. At 198° K the N.Q.R. frequencies are about 30.280 and 34.530 Mc/s respectively and at 294° K, 29.300 and 34.270 Mc/s. There are 7 figures.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii (All-Union Scientific Research Institute of Metrology)

SUBMITTED: June 26, 1961
Card 2/2

BRODSKIY, A.D.; KREMLEVSKIY, V.P.; SAVATEYEV, A.V.

New methods for establishing a thermodynamic low-temperature
scale. Izv.tekh. no.9:35-36 S '62. (MIRA 15:11)
(Thermometry)

BRODSKIY, A.D.; SOLOV'YEV, V.I.

Establishing reference points of a temperature scale by the
method of nuclear quadrupole resonance. Izv.tekh. no.9:39-40
S '62. (MIRA 15:11)
(Thermometry)
(Nuclear magnetic resonance and relaxation)

BRODSKIY, A.D.

Reproduction of a temperature scale based on quadrupole nuclear resonance. Trudy inst.Kom. stand., mer i izm.prib. no.63:230-234 '62. (MIRA 15:8)

/1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni D.I.Mendeleyeva.
(Thermometry) (Nuclear magnetic resonance and relaxation)

ACCESSION NR: AR4027926

S/0137/64/000/002/3016/B017

SOURCE: RZh. Metallurgiya, Abs. 2B116

AUTHOR: Brodskiy, A. D.

TITLE: Measurement of low temperatures by means of a platinum resistance thermometer without its calibration at the boiling point of oxygen

CITED SOURCE: Tr. in-tov Kom-ta standartov, mer i izmerit. priborov pri Sov. Min. SSSR, vy*p. 71(131), 1963, 149-152

TOPIC TAGS: low temperature measurement, platinum resistance thermometer, resistance thermometer

TRANSLATION: It is shown that Pt resistance thermometers can be checked without the necessity of calibration with the boiling point of O₂ by use of an empirical formula relating the relative resistance of Pt for the boiling point of O₂ and the value of its temperature coefficient. The proposed thermometer gives measurements accurate within $\pm 0.006^\circ$. O. Blinov

DATE ACQ: 19Mar64

SUB CODE: PH

ENCL: 00

Card 1/1

BRODSKIY, A.D.

Measurement of low temperatures with a platinum resistance thermometer without intercomparing it at the boiling point of oxygen.
Trudy inst.Kom.stand.mer i izm.prib. no.71:149-152 '63.

Device for measuring rapidly changing temperature below 0° C.
Ibid.:182-186 (MIRA 17:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im.
D.I. Mendeleyeva.

L 24515-65 EWT(d)/EWP(c)/EWA(d)/EWP(v)/T/EWP(k)/EWP(h)/EWP(l) Pf-L

ACCESSION NR AM5002554

BOOK EXPLOITATION

S/

Brodskiy, Aleksandr Davidovich; Kuz'menko, Vladimir Kuz'mich; Solov'yev,
Vladimir Ivanovich

Modern physical and technical methods in shipbuilding (Sovremennyye fiziko-
tekhnicheskiye metody v sudostroyenii), Leningrad, Izd-vo "Sudostroyeniye",
1964, 188 p. illus., biblio.

TOPIC TAGS: shipbuilding, electrical engineering, radio equipment, ultrasonics,
radioactive isotope, inspection equipment

PURPOSE AND COVERAGE: This book describes some current physical-technical methods
recommended for use in the shipbuilding industry. These methods include the
electrical engineering, radio electronics, use of ultrasonics, and radioactive
isotopes. Handbook data are included on the industrial equipment used in ship-
building. The book is intended for engineers, technicians, and workers in the
sections of mechanization and quality control-inspection equipment of the ship-
building and machine building plants. It can be useful for students of ship-
building institutes and departments of shipbuilding technicums.

TABLE OF CONTENTS [abridged]:

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L 24515-65

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Ch. II. Electrical engineering -- 23

Ch. III. Radioelectronics -- 66

Ch. IIII. Ultrasonic methods -- 107

Ch. V. Radioactive isotopes and their use for quality control and automation
of engineering processes -- 140

Bibliography -- 188

SUBMITTED: 23 May 64

SUB CODE: EC, IE

NO REF SOV: 034

OTHER: 005

Card 2/2

BRODSKIY, A. E.; POKHODENKO, V. D.; GANYUK, L. N.;

"Die Umlagerung von Phenoxyradikalen in Benzylradikale bei der Oxydation sterisch gehinderter Phenole"

Third Working Conference on Stable Isotopes, 28 October to 2 November 1963, Leipzig.

BRODSKIY, A.E.; POKHODENKO, V.D.; GANIUK, L.N.

Transformations of free radicals formed by oxidizing sterically hindered phenols. Roczniki chemii 38 no. 1:105-113 '64.

1. Institute of Physical Chemistry, Academy of Sciences,
Ukrainian S.S.R., Kiev.

BRODSKIY, A.F.

Tibio-fibular synostosis as a therapeutic method in painful and defective leg stump; preliminary report. Khirurgia, Moskva no.3: 46-49 Mar 51. (CIWL 20:7)

1. Of Saratov Scientific-Research Institute of Restorative Surgery and Orthopedics (Acting Director--A.F. Brodskiy).

YARALOV-YARALYANTS, Vardan Aleksandrovich, kandidat meditsinskikh nauk;
BRODSKIY, A.F., redaktor; GITSHTEYN, A.D., tekhnicheskij redaktor

[First steps for the physician in the treatment of accident cases]
Pervaya vrachebnaya travmatologicheskaya pomoshch'. Kiev, Gos. med.
izd-vo USSR, 1956. 201 p. (MIRA 9:8)
(TRAUMATISM)

SHUMADA, Ivan Vladimirovich, kand.med.nauk; BRODSKIY, A.F., red.;
POTOTSKAYA, L.A., tekhn.red.

[Traumatic hip dislocations and their treatment] Travmaticheskie vyivkhi bedra i ikh lechenie. Kiev, Gos.med.izd-vo USSR, 1959. 92 p. (MIRA 13:1)
(HIP JOINT--DISLOCATION)

YARALOV-YARALYANTS, Vardan Aleksandrovich, kand.med.nauk; BRODSKIY, A.F.,
red.; GITSEYIN, A.D., tekhnred.

[Medical first aid in accidents] Pervaya vrachebnaia travmato-
logicheskaya pomoshch'. 2. izd., ispr. i dop. Kiev, Gos.med.
izd-vo USSR, 1968. 281 p. (MIRA 14:12)

(FIRST AID IN ILLNESS AND INJURY)
(MUSCULOSKELETAL SYSTEM--ACCIDENTS)

BRODSKIY, A.F. [Brods'kiy, A.F.], kand.med.nauk

Biological film. Nauka i zhyttia no.11#44-45 N '61.

(MIRA 14:12)

1. Laboratoriya konservuvannya tkanin Ukrain's'kogo naukovo-
doslidnogo institutu ortopedii i travmatologii.
(SKIN GRAFTING)

BRODSKIY, A.F., kand.med.nauk

Biological film. Nauka i zhizn' 29 no.6:32-33 Je '62.

(MIRA 15:10)

(SKIN GRAFTING)

YARALOV-YARALYANTS, Vardan Aleksandrovich, kand. med. nauk;
ERODSKIY, A.F., red.

[Traumatological first aid by the doctor] Pervaya vrazhebnaya travmatologicheskaya pomoshch'. Izd.3., ispr. i dop. Kiev, Zdorov'ia, 1964. 293 p. (MIRA 18:1)

L 02321-67
 ACC NR: AR6023339 (A, N) SOURCE CODE: UR/0299/66/000/003/M032/M033
 AUTHOR: Brodskiy, A. F.; Binyashevskiy, E. V.; Kozlova, D. A. 18
 TITLE: Comparative evaluation of experimental wound healing under 22 B
 homoplastic skin transplants and under biologic film
 SOURCE: Ref zh. Biol, Part II, Abs. 3M200
 REF SOURCE: Sb. Aktual'n. vopr. kliniki i lecheniya ortopedo-travmatol.
 bol'nykh. Kiyev, Zdorov'ya, 1965, 199-203
 TOPIC TAGS: rodent, wound, tissue transplant, skin physiology
 ABSTRACT: In 120 guinea pigs three sections of skin in circular shapes
 (2 cm. in diameter) were cut from the animal's back. A biological film
 (prepared from animal or human skin) was applied to the first wound and
 a homotransplant of fresh skin was applied to the second wound; the
 third wound was left free to heal under a scab. Two wounds were
 inflicted on control animals which healed under similar conditions---
 under a scab and under a biological film. Healing of wounds under a
 biological film is accompanied by formation of delicate painless scars
 in which correctly oriented gelatin giving fibers are found. Disorderly
 growth of connective tissue fibrous elements was found in wounds under
 Card 1/2 UDC: 591.169+577.99

L 02321-67

ACC NR: AR6023339

fresh skin, and also the appearance of complex nerve formations of the micronerve type. Scars of wounds healing under a scab did not differ from the scars forming under fresh skin, with the exception of the nerve formations which resembled those formed under a biological film. Disturbed protein metabolism was noted in all cases of healing. Protein metabolism was restored in 1 mo in wounds healing under a biological film; protein metabolism was restored later in the other cases. N. S.
Translation of abstract.

SUB CODE: 06

Card 2/2

vmb

BRODSKIY, A. G.

Brodskiy, A. G. "Gas stoves for warming the worker-agent in the Azerb. field",
Azerbaydzh. noft. khoz-vo, 1948, No. 12, p. 25-26.

So: U-3261, 10 April 53, (Letopis 'Zhurnal 'nykh Statey, No. 12, 1949).

29773
S/194/61, 000/006/064/077
D201/D302

9,6000 (1089,1159)

AUTHORS: Brodskiy, A.I., Akhiyezer, A.N., Magda, V.I. and
Sen'ko, A.P.

TITLE: Standard calorimetric equipment for checking small
power meters

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
no. 6, 1961, 18-19, abstract 6 I107 (V sb. '100 let
so dnya rozhd. A.S. Popova', M., AN SSSR, 1960,
188-193)

TEXT: The arrangement is based on the division of the power mea-
sured by the calorimeter by means of a standard directional coupler.
It consists of power source, wavemeter, SHF power level-stabilizer,
attenuator, standard directional coupler and a standard calorimeter. X
The SHF power sources are typical, oil immersed klystrons. The use
of an oil bath and a good supply stabilization makes the 15 min.
frequency drift better than $1-2 \times 10^{-5}$. The power level stabilizer

Card 1/2

297B

S/194/61/000/006/064/077
D201/D302

Standard calorimetric equipment...

consists of a directional coupler, a reference detector, d.c. amplifier and magnetically controlled attenuator with an irreversible rotation of the plane of TE_{11} wave in a circular waveguide with a ferrite in a longitudinal magnetic field. The power level stabilizer keeps the output power level within $\sim \pm 0.5\%$ with changes of $\pm 20\%$ of the input power. The standard directional coupler has the straight-through attenuation of about 10 db and directivity ≥ 25 db $SWR \leq 1.07$. The standard microcalorimeters permit measurement of power levels of 2-100 milliwatts with an error $\leq \pm 1.5\%$. The SWR of the calorimeters is better than 1.16. The process of measurement is semi-automatic and takes 2-3 minutes. The calorimeter works on the principle of a cooled thermocouple which makes it possible to replace the SHF power by that of d.c. at a constant temperature of the calorimetric system. The sources of errors have been analyzed. [Abstracter's note: Complete translation]

Card 2/2

BRODSKIY, A. I., Candidate Med Sci (diss) --- "Diathermy coagulation in the complex method of treating erosions and certain other disorders of the cervix uteri". Kiev, 1959. 12 pp (Kiev Order of Labor Red Banner Med Inst im Acad A. A. Bogomolts), 250 copies (KL, No 26, 1959, 127)

BRODSKIY, A. I., Kiev, ul. Saksaganskogo, 41, kv. 3

Ethymidine in the treatment of neglected cases of female genital cancer. Vop. onk. 8 no.2:64-68 '62. (MIRA 15:2)

1. Iz Kiyevskogo gorodskogo onkologicheskogo dispansera (glav. vrach - V. G. Khodachenko, konsul'tant - dots. A. I. Yevdokimov)

(CYTOTOXIC DRUGS)

(GENERAL ORGANS, FEMALE--CANCER)

EARLIER PUBLICATIONS FOR THIS AUTHOR ARE AVAILABLE IN THE INACTIVE FILE -- WE
WILL PULL THEM UPON REQUEST.

BRODSKIY, A. IA.

Technology

Tekhnologiya dugovoi elektrosvarki v inertnoi srede (Technology of arc welding in an inert atmosphere). Moskva, Mashgiz, 1951. 168P.

9. Monthly List of Russian Accessions, Library of Congress, November 1953 2/2 Unclassified.

BRODSKIY, A.I.

USSR/Chemistry - Isotopes

Oct 51

"Heavy Water," I.P. Grangerov, Cand Chem Sci

"Nauka i Zhizh'" Vol. XVIII, No 10, pp 12-14

A.I. BRODSKIY, Corr Mem, Acad Sci USSR and his group were the 1st to obtain heavy water and heavy water concentrates in the USSR. They developed a method for the sep detn of deuterium water and heavy oxygen water in natural waters by measuring sp wts and indexes of refraction in pure samples. Geochemist A.P. VINOGRADOV, Corr Mem, Acad Sci USSR, et al ded interesting work on the origin of minerals by investigation the isotope compn of water prep from the oxygen contained in the minerals. Heavy water and deuteroparaffin are the most effective moderators in atomic energy piles.

PA 213T24

SULIMA, L.V.; BRODSKIY, A.I.

Rate of hydrogen exchange in dissolved ammonium salts. Ukr.khim.zhur.
17 no.2:165-172 '51. (MIRA 9:9)

1. Institut fizicheskoy khimii AN USSR.
(Hydrogen) (Ammonium salts)

BRODSKIY, A. I.

185TL7

USSR/Chemistry - Tautomerism
Theory of Resonance

Mar 51

"Reply to V. I. Stepanov," A. I. Brodskiy, L. I. Chervyatsova, G. P. Mikhukhin, Inst Phys Chem
Imeni L. V. Pisarzhevskiy, Acad Sci Ukrainian
SSR, Kiev

"Zhur Fiz Khim" Vol XXV, No 3, pp 380-382

Authors reply to B. I. Stepanov's criticism
("Zhur Fiz Khim" Vol XXIV, 1950, p 1,023) of their
previous article ("Zhur Fiz Khim" Vol XXIV, 1950,
p 968). On basis of their use of deuterium
exchange to study toluene and derivs, Stepanov

185TL7

USSR/Chemistry - Tautomerism
(Contd)

Mar 51

accused authors of supporting theory of resonance
by their denial of tautomerism in toluene (as
proposed by P. P. Shorygin) and their proposal
of "acid disson" scheme. Authors assert that
their data proves absence of Shorygin's tautomer-
ism in toluene, though not necessarily in its
derivs, and that there is no connection between
concept of tautomerism and theory of resonance.

185TL7

USSR/Chemistry - Resonance

Aug 51

"Final Answer to B. I. Stepanov," A. I. Brodskiy,
L. I. Chervyatsova, G. P. Mikhukhin, Kiev

"Zhur Fiz Khim" Vol XXV, No 8, pp 994

Referring to Stepanov's communication in the same
issue of "Zhur Fiz Khim," deny that they made the
admissions imputed to them by Stepanov. State by
that Brodskiy admitted long ago the error made by
him when he discussed in his textbook the nonaddi-
tivity of bond energies from the standpoint of the
resonance theory; that Stepanov has nothing to do with

190123

LC

Aug 51

USSR/Chemistry - Resonance (Contd)

the admission of this error; that tautomerism of
toluene and those of its derivs studied by Brodskiy
et al (2 nitro-derivs and mesitylene) definitely
does not exist, contrary to Stepanov's opinion.

190123

BRODSKIY, A. I.

LC

CA

10

Possibility of tautomerism of toluene. A. I. Brutskii, I. I. Chervyatsova, and G. P. Mikhukhin (Acad. Sci. Ukrain. S.S.R., Kiev). *Doklady Akad. Nauk S.S.S.R.* 76, 843 (1951); cf. *Zhur. Fiz. Khim.* 24, 968(1950); C.A. 41, 2704. --Heating MePh contg. D either in the Me group (prepd. by Grignard method with a D_2O hydrolytic step) or in 3 positions (ortho and para) in the ring, with the aim of establishment of D transfer from side chain to the ring or vice versa, showed no evidence of such tautomeric shifts. The products were oxidized to BrOH whose H-D compn. was established by conventional combustion methods. Heating of the deuterated MePh specimens even to 150-60° in sealed tubes for 85-275 hrs. failed to show any deviation from the normal D content in the previous locations. Hence Shorygin's idea (*J. Russ. Phys.-Chem. Soc.* 34, 767(1930)) does not apply to MePh. G. M. Kosolapoff

CA

Height of the potential barrier in the hydrogen bonds of benzosequinhydrone. A. I. Brodskii and I. P. Grigorov (L. V. Piarzhhevskii Inst. Phys. Chem., Acad. Sci. Ukr. S.S.R., Kiev). *Doklady Akad. Nauk. S.S.S.R.* 79, 277-9 (1951).—The rate of redistribution of D between quinone and hydroquinone occurring in the decompn. of the tagged quinhydrone, $C_6D_4(OH)_2 \cdot C_6H_4O_2$, was measured at 107.6, 115.06, and 119.8°. The rate is 1st-order up to about $x = 0.1$ (x = fraction of D) passed from hydroquinone to quinone; at equil. it is assumed that $x_{eq} = 0.5$. The side reaction responsible for the deviation from the 1st-order kinetics at later stages is not clear; that it is not oxidation

follows from the fact that replacement of air by N_2 does not change x . In the 1st-order range, $10^{12}k = 0.80, 3.80$, and 7.08 sec.^{-1} , resp., at the 3 temps. This gives $\log k = 24.070 - (11.10 \times 10^3/T)$, hence the activation energy $E = 60,314 \text{ cal./mole}$. This is lower than the true value of E which should be calcd. by $k = A[(E/RT)^{m-1}/(m-1)!]e^{-E/RT}$, where m = no. of the vibrational degrees of freedom entering into the activation energy. This gives for the true activation energy $E = 60314 + RT(m-1)$. On the assumption that the internal vibrations are loosely bound with the external vibrations, quinhydrone may be considered as a system of 8 oscillating centers with $m = 18$. This gives $E = 63,380 \text{ cal./mole}$, and $A = 3.3 \times 10^{13} \text{ sec.}^{-1}$. The value $E = 63 \text{ kcal./mole}$ is certainly close to the upper limit. It being very probable that the passage of the 2 hydrogen-bonded H atoms in quinhydrone takes place simultaneously (which is borne out by the absence of a decompn. into semiquinones), the height of each potential barrier sepg. the 2 min.-energy equil. positions $OH \dots O$ and $O \dots HO$ is $E/2 = 32 \text{ kcal./mole}$ from the zero vibrational level or 37 kcal./mole from the bottom of the potential well. This high value is plausible in view of the deep rearrangement of bonds involved in the transition $C_6D_4(OH)_2 \cdot C_6H_4O_2 \rightleftharpoons C_6D_4O_2 \cdot C_6H_4(OH)_2$. The high value of A is explained by activation through transfer of vibrational energy in the crystal lattice, as contrasted with the transfer of translational kinetic energy in collisions between gaseous moles. Possibly the reaction proceeds by a chain mechanism in the lattice. N. Thon

BRODSKIY, A. I.

PHASE X

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 606 - X

BOOK

Call No.: QD466.B64

Author: BRODSKIY, A. I.

Full Title: CHEMISTRY OF ISOTOPES

Transliterated Title: Khimiya izotopov

PUBLISHING DATA

Originating Agency: Academy of Sciences, USSR. Division of Chemical Sciences

Publishing House: Publishing House of the Academy of Sciences

Date: 1952

No. pp.: 352

No. of copies: 7,000

Editorial Staff: Ncne

PURPOSE AND EVALUATION: This is a textbook for postgraduate chemists specializing in nuclear chemistry. The author's purpose was to bring up to date the knowledge of the chemistry of isotopes by covering the latest Russian and non-Russian monographs and periodicals on this subject. The book is well planned, clearly presented, and provides a source of information which the research worker will find valuable. It will also be worthwhile reading for persons interested in familiarizing themselves with the techniques and results obtained.

TEXT DATA

Coverage: The book is a comprehensive review of the chemistry of

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Khimiya izotopov

AID 606 - X

isotopes with a selected list of references. The coverage of Russian literature is more than adequate. The book is intended for research chemists interested in nuclear chemistry. Therefore, certain topics related to the subject of this book are specifically excluded from detailed treatment. These are the problems of nuclear physics and the uses of tagged atoms in biology and medicine. The first chapter supplies background on the physical basis of radioactive phenomena and a general description of isotopes. Many instruments for radioactive assay are next discussed. Natural and artificial isotopes and various methods of separation of stable isotopes are reviewed. In scope this book ranges from the equilibrium distribution of isotopes in different reactions to the equations for kinetic analysis of isotope exchange reactions. The book is plentifully illustrated with tables, diagrams and equations.

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Khimiya izotopov

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Khimiya izotopov

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Khimiya izotopov

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No. of References: Total 305. 190 Russian (1881-1951); 115 non-Russian (1931-1951).	
Facilities: Many Soviet scientists are mentioned.	

5/5

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Apparatus, Plant Equipment,
and Unit Operations

The role of the native (Russian) science in discovery of
isotopy. A. I. Brodskii. *Ukrain. Khim. Zhur.* 19, 447-
84 (1952) (in Russian).—A historical review with references
stressing the predictions of Butlerov in 1881-2.
G. M. Kosolapoff

BRODSKIY, A. I.

USSR/Chemistry - Hydrogen bond, Deuterium 11 Jul 52

"Height of Potential Barrier at Hydrogen Bonds in Benzoquinhydrone," A. I. Brodskiy, Corr Mem, Acad Sci Ukrainian SSR, I. P. Grigorov, Inst of Phys Chern iment L. V. Plisarchevskiy, Acad Sci Ukrainian SSR

"Dok Ak Nauk SSSR" Vol LXXIX, No 2, pp 277-279

If one of the benzene nuclei of quinhydrone contains deuterium, delocalization of H in the O-H - -O bond will be indicated, upon sepn into quinone (I) and hydroquinone (II), by the presence of deuterium in the other nucleus. The change from 214710

deuterium-I to deuterium-II through transfer of H from one O to the other in the O-H---O bond was actually found to occur at sufficiently high temps. By studying the kinetics of this change, the potential barrier surmounted in the transfer was detd.

214710

BRODSKIY, A. I.

1 Aug 52

USSR/Chemistry - Isotopes, Organophosphorus Compounds

"Investigation of the Reaction Mechanism of the Reduction of Diazonium Salts.
Reduction with Hypophosphorous Acid," G. P. Miklokhin, A. F. Sokasheva, Inst of Phys
Chem Lenin L. V. Pionarshevskiy, Acad Sci Ukrainian SSR

"Dok Ak Nauk SSSR" Vol 85, No 4, pp 827-830

In the reduction of diazonium salts of hypophosphorous acid, the hydrocarbon radicals become attached to the hydrogens bound to the phosphorus atom and not to the oxygen. This is proved in the present work by investigating the reaction under use of D_2O and by taking advantage of the different rates of isotopic exchange of PH and OH.

PA 227T17

BRODSKII, A. I.

RT-111 (Tautomerism of hypophosphorous and phosphorous acids). O tautomerii
forfornovatistoi i fosforistoi kislota.

Doklady Akademii Nauk SSSR, 85(6): 1277-1280, 1952.

BRODSKIY, A. I.

USSR/Chemistry - Hydrocarbons, Isotopes Oct 52

"Investigating the Mobility of Hydrogen Atoms in the Toluene Nucleus," I. I. Kukhtenko, A. I. Brodskiy, Corr Mem Acad Sci USSR

DAN SSSR, Vol 86, No 4, pp 733-735

The isotopic shift of hydrogen atoms in toluene was studied with the aid of deuterium. The results prove that there is no shifting of the hydrogen atoms from the o-position to any other in toluene, even after heating for 5 days at a temp above the critical.

264718

VYSOTS'KYY, Z.Z.; NEYMARK, I.Ye.; ^ABRODS'KYY, G.I., diysnyy chlen.

Applicability of the mechanism forming the porous structure of hydrophilic gells of mixed sorbents. Dop. AN URSR no.5:333-336 '53. (MLRA 6:10)

1. Akademiya nauk Ukrayins'koyi RSR (for Brods'kyy). 2. Instytut fizychnoyi khimiyi im. L.V.Pysarzheva'koho Akademiyi nauk Ukrayins'koyi RSR (for Vystos'-kyy and Neymark). (Sorbents)

BRODSKIY, A.I.; SULIMA, L.V.

Hydrogen exchange and tautomerism of hypophosphorus and phosphorus acids. Ukr.khim.zhur. 19 no.3:247-254 '53. (MLRA 7:4)

1. Institut fizicheskoy khimii im. L.V.Pisarshevskogo Akademii nauk USSR. (Phosphorus acids)

The study of the exchange in P-H groups of H for the deuterium of heavy water showed that tautomerism is absent in the anion of hypophosphorus acid, in phosphorous acid, and in the anion of phosphorus acid and that it is present in undissociated hypophosphorous acid. The rate const of the tautomeric transformation of hypophosphorous acid was detd. Confirmation of the explanation offered earlier for the slow hydrogen exchange in soln was obtained. 261T15

Nov, I. P.; BRODSKIY, A. I.

Experimental determination of the degree of the potential barrier in
hydrogen bonds of benzoquinhydrone. Zhur. ob. khim. 23 no.7:1193-1199
Jl '53. (MLRA 6:7)

1. Institut fizicheskoy khimii imeni L. V. Pisarzhevskogo Akademii nauk
Ukrainskoy SSR. (HYdrogen) (Quinhydrone) (Electromotive force)
(CA 47 no.22:11826 '53)

USSR 1

Isotopic exchange of phosphorus and sulfur in ethyl esters of phosphorous and sulfurous acids. A. I. Brodskii and L. L. Chervyatsova. *Doklady Akad. Nauk S.S.S.R.* 60, 545-5 (1953); cf. *C.A.* 45, 3280; 47, 830d. —No P exchange was observed between ordinary $(EtO)_3P$ and ^{32}P -labeled $EtP(O)(OEt)_2$ in 180 hrs. at room temp. and 6 hrs. at 100° . Addn. of EtI to the system failed to give a different result. Thus the isomerization of $(EtO)_3P$ to the phosphonate is Ir-reversible and the existence of tautomerism among neutral phosphites is conclusively disproven. Similar lack of S exchange was found between $OS(OEt)_2$ and ^{34}S -labeled $O_3SEt(OEt)$ even after 5 hrs. at 100° or 690 hrs. at room temp. The labeled $EtP(O)(OEt)_2$ was prepd. from isomerization with EtI of the labeled $(EtO)_3P$, prepd. from labeled PCl_3 by conventional method. Labeled $O_3SEt(OEt)$ was prepd. from EtI and labeled Ag_2SO_3 in Et_2O ; $O_3SEt(OEt)$, b. $205-7^\circ$, n_D^{20} 1.4197, d_4^{20} 1.1427; $OS(OEt)_2$, b. $157.5-8^\circ$, n_D^{20} 1.4147; $(EtO)_3P$, b. $159-70^\circ$, n_D^{20} 1.4310; $EtP(O)(OEt)_2$, b. $207-9^\circ$, n_D^{20} 1.4169. G. M. K.

BRODSKIY, A. I., CORR MEM, ACAD SCI USSR

USSR / Chemistry - Isotopes 21 Sep 53

Isotopic Exchange of Oxygen in Solutions of the Acids of Phosphorus, "A. I. Brodskiy, Corr Mem, Acad Sci USSR, and L.V. Sulina, Inst of Phys Chem in L.V. Pisarzhevskiy, Acad Sci Uk SSR

DAN SSSR, Vol 92, No 3, pp 589-592

Studied the rate of oxygen exchange in H_3PO_2 , H_3PO_3 , H_3PO_4 , and their salts using the heavy isotope of O. Discusses structure and behavior of the compds investigated and makes some generalized conclusions concerning the relationship between the exchange of O in soln and the structures of mols and ions of inorg acids.

268T3

БРОДСКИЙ, А. И.

U.S.S.R.

The mechanism of the hydrogen-isotope replacement in solutions. A. I. Brodskiy, *Doklady Akad. Nauk S.S.S.R.* 93: 817-30(1963).—An explanation is offered for the extreme rapidity (A. I. Brodskiy, *C.I.* 43, 6011r(10-9)) or the great tardiness of the double exchange reaction $D^+ \rightleftharpoons H^+$. Since a practically instantaneous double exchange reaction by ionization appears improbable, a substitute explanation is offered in an intermediate-compd. formation in a process independent of ionization, but proceeding parallel to it. Three reaction-mechanism types involved in the possible slow $D^+ \rightleftharpoons H^+$ are discussed. W. M. S.

BRODSKIY, A. I.

USSR/ Nuclear Physics

Card : 1/1

Authors : Ratnov, V. B. Cand. of Chem. Sciences

Title : The book on marked atoms. The chemistry of isotopes

Periodical : Priroda, 6, 121 - 123, June 1954

Abstract : A professional review of the book by A. I. Brodskiy entitled "The Chemistry of Isotopes" published by the Academy of Sciences USSR in 1952.

Institution :

Submitted :

BRODSKIY, A. I.

D. I. Mendeleev theory of polythionates and its confirmation in recent work. A. I. Brodskii, *Uspekhi Khim.* 23, 014-21(1954); cf. *J. Russ. Phys.-Chem. Soc.* 2, 234(1870).-- A brief historical review in which Mendeleev's view of thionic acids as analogs of carboxylic acids is discussed. 25 references. G. M. Kosolapoff

BRODSKIY, A. I.

Mechanism of hydrogen exchange and some protolytic reactions in solutions. A. I. Brodskiy. *Zhur. Obshchei Khim.* 24, 413-22 (1954); cf. *C.A.* 43, 5011c. Isotope-exchange reactions of H in solns. are classified as rapid or slow, depending on the presence or absence of unshared electron pairs on the atom with which the exchanging H atom is bound. The rapid exchange occurs independently of electrolytic disson., which is a process parallel to the exchange. Rapid exchange which does not require catalysts and which takes place at any temp. is found in NH_3 , HO , SH , and HCl , etc., links. The slow exchange is typical of the CH link. The nature of the exchange is not detd. by energy of the link, its polarization, or ionic character. The SH link shows no H exchange, and this is predictable on the basis of lack of unshared electron pairs on S atoms. Exchange of the rapid type with D_2O occurs with even very weak acids and is not a consequence of disson., which can be interpreted by solvation effects. The D-H exchange here takes place in one step through an intermediate which appears to be formed by simultaneous transfer of the proton to the unshared electron pair of the H acceptor and uptake of D ion from the latter to the electron pair of the original substance; the transition state is a 4-center structure. The mechanism of slow exchange is detd. by the rate of electrolytic disson. If the latter is rapid, the exchange occurs through the formation of free ions: in alk. medium: $\text{HX} + \text{YD} = \text{X}^- + \text{HYD}^+ = \text{XD} + \text{YH}$, in acid medium: $\text{HX} + \text{YD} = \text{DXH}^+ + \text{Y}^- = \text{XD} + \text{YH}$, with possibility of intermediate steps. If the electrolytic disson. is slow, the exchange occurs in 1 step with transition stage of 4-center type. Both types are found in CH links. The 4-center mechanism in some instances may be replaced by electrophilic displacement mechanism. The ionic mechanism represented above for alk. solns. is typical of slow exchange with basic donors, when it is similar to enolization, racemization, and similar reactions. Specific cases are discussed in detail. 29 references. G. M. Kosolapoff

Inst. Phys. Chem. in Presynthetic
AS USSR

Brodskiy, A. I.

USSR:

A study of the reactions of polythionates by means of tagged sulfur. I. Trithionates. A. I. Brodskiy and R. K. Breimenko. *Zhur. Obshch. Khim.* 24, 1142-50; *Doklady Akad. Nauk. S.S.S.R.* 95, 429-42 (1954).—The kinetics of the reactions involved in the formation of trithionates was studied by means of radioactive S. Three exchange methods were used. $S^{35}Cl_3$ reacted with $KHSO_4$ (cf. Stamm, *et al.*, *C.A.* 37, 5429) formed initially $S^{35}(OH)_3$ which then reacted with HSO_4^- to give $S^{35}(SO_3)_3$. $Na_2S^{35}SO_3$ reacted with SO_3 (cf. Kurtmacker, *et al.*, *C.A.* 25, 658) formed at first $S^{35}(OH)_3$ which reacted with $2S^{35}SO_3$ to give $S^{35}(S^{35}SO_3)_3$ and finally with SO_3 formed tri- and tetrathionates. $Na_2S^{35}SO_3$ was oxidized with H_2O_2 (cf. Willstater, *Ber.* 36, 1821 (1903)); the first product was $O_3S^{35}SO_3$ (cf. Zilberman, *et al.*, *C.A.* 34, 7459) which reacted with H_2O_2 and $S^{35}SO_3$ to give $O_3S^{35}S^{35}SO_3$ or $O_3S^{35}S^{35}SO_3$. Only the groups $S^{35}O_3$ and SO_3 enter into the exchange reactions between thiosulfates and higher thionates (cf. Pavu, *C.A.* 47, 12083r). I. Benecowitz.

BRODSKII, A. I.

Battelle Technical Review
July, 1954
Chemistry Physical

2
① - 1/27/54
9350* Mechanism of the Exchange of Hydrogen Isotopes
in Solution. (Russian.) A. I. Brodskii, *Doklady Akademii Nauk*
SSSR, v. 93, no. 5, Dec. 11, 1954, p. 847-850.

Conditions causing fast and slow exchange. Two basic types
of slow exchange distinguished, depend on ratio of rate of
exchange to rate of electrolytic dissociation. Survey of previous
work. 20 ref.

BRODSKIY A. I.

USSR.

The mechanism of formation of secondary amines studied with heavy nitrogen. A. I. Brodskii, B. A. Geller, and R. Yu. Sheinfaia. *Doklady Akad. Nauk S.S.S.R.* 93, 273-6 (1954).—Heating together mixts. of primary aromatic amines and their HCl salts yields NH_4Cl and secondary amines. The reaction was studied by means of N^{15} -labeled PhNH_2 (prepd. from N^{15} -labeled NH_4Cl , which yielded labeled NH_3 , and this with BzCl gave labeled BzNH_2 , which was converted to PhNH_2 by NaOEt treatment), $1\text{-C}_{10}\text{H}_7\text{NH}_2$, and BzNH_2 . The reactions were run at 230–40° and the products examd. for N^{15} content with a mass spectrometer. In the formation of $1\text{-C}_{10}\text{H}_7\text{NHPh}$ the NH_2 group of the naphthylamine is eliminated. In the formation of BzNHPh , the NH_2 group of BzNH_2 is cleaved. In the formation of PhNH_2 from labeled PhNH_2HCl and ordinary PhNH_2 , the N^{15} content is equally distributed between both reaction products indicating that direct action of PhNH_2 on is excluded; this also shows a relatively rapid transfer of a proton from one amine to another; this transfer occurs very rapidly even at room temp. Thus in a $\text{RNH}_2\text{-R'NH}_2$ mixt. the proton passes rapidly from 1 mol. to the other and in the formation of a secondary amine or substituted amide the primary amines act as bases. The role of the amine salt consists of facilitating proton transfer, catalyzing the reaction according to the usual acid-catalysis scheme. No isotope-N exchange occurs in the systems: $\text{PhNH}_2\text{-}1\text{-C}_{10}\text{H}_7\text{NH}_2$, $\text{NH}_4\text{Cl-PhNH}_2$, $\text{NH}_4\text{Cl-BzNH}_2$, or $\text{PhNH}_2\text{-BzNH}_2$. Thus the above reactions cannot occur by simultaneous cleavage of both amino groups.

G.M. Kosolapoff

2

BRODSKIY, A.I.; YEREMENKO, R.Ye.

Study of the reactions of trithionates by means of radioactive sulfur. Dokl.AN SSSR 95 no.3:539-542 Mr '54. (MLRA 7:3)

1. Institut fizicheskoy khimii im. L.V.Pisarzhevskogo Akademii nauk USSR. 2. Chlen-korrespondent Akademii nauk SSSR (for Brodskiy).
(Trithionate) (Sulfur--Isotopes)

PISARZHEVSKIY, Lev Vladimirovich; BRODSKIY, A.I., redaktor; KORNEYCHUK, G.P., redaktor; HOYTER, V.A., redaktor; STUKANOVSKAYA, N.A. . redaktor; TITKOV, B.S., redaktor; SIVACHENKO, Ye.K., tekhnicheskiy redaktor

[Selected works on catalysis] Izbrannye trudy v oblasti kataliza. Kiev, Izd-vo Akad.nauk USSR, 1955. 150 p. (MLRA 8:10)

1. Deystvitel'nyy chlen AN USSR (for Brodskiy)
(Catalysis)

BRODSKIY, A. I.

"Investigations of the Structure and Reactivity of Chemical Compounds by Isotopes Methods".

Institute of Physical Chemistry, Academy of Sciences Ukrainian SSR

Report appearing in 1st Volume of "Session of The Academy of Sciences USSR on the Peaceful Use of Atomic Energy, 1-5 July 1955", Publishing House of Academy of Sciences USSR, 1955.

SO: Sum 728, 28 Nov 1955.

870517, S.I.
BRODSKIY, A.I.; DEMIDENKO, S.G.; STRIZHAK, L.L.; LECHUKHIEB, V.R.

Rapid mass-spectrometric micromethod for the isotopic analysis
of oxygen in water. Zhur.anal.khim. 10 no.4:256-261 J1-Ag '55.
(MLRA 8:9)

1. Institut fizicheskoy khimii imeni L.V.Pisarshevskogo AN USSR,
Kiyev.

(Mass spectrometry) (Water--Analysis) (Oxygen--Isotopes)

BRODSKIY, A-I.

3

V Investigations of the reactions of polythionates, with the aid of labeled sulfur. II. Reaction of tetrathionate and pentathionate. R. K. Bremenko and A. I. Brodskiy. *Zhur. Obshchei Khim.* 25, 1231-50 (1955); *cf. C.A.* 49, 2835h. Tetrathionate and pentathionate, like trithionate, contain unbranched chains of sulfide S atoms, with sulfite groups at the ends (*cf. C.A.* 48, 13290g). Distribution of the labeled S was detd. by treatment of the products with KCN: $S_4O_6^{2-} + 3CN^- + H_2O = S_2O_4^{2-} + SO_3^{2-} + SCN^- + 2HCN$; or $S_5O_6^{2-} + 4CN^- + H_2O = S_2O_4^{2-} + SO_3^{2-} + SCN^- + 2HCN + 2HCN$. Distribution in the thiosulfate was then detd. by reaction with Ag^+ : $S_2O_3^{2-} + 2Ag^+ + H_2O = Ag_2S + SO_4^{2-} + 2H^+$. All the central (sulfide) S atoms of the polythionate appear in SCN^- and in the sulfide S atom of $S_2O_3^{2-}$ (finally in Ag_2S), whereas all end S atoms appear finally as SO_4^{2-} . Such exchange processes as occur among the ions obtained do not interfere with the detn. To a soln. of 4.5 g. labeled S_2Cl_2 in 30 ml. ligroine at -15° was added in portions, with cooling, 45 ml. satd. (at 0°) aq. soln. of SO_2 . The org. layer was removed, air was passed through the aq. layer to remove SO_2 , the soln. was cooled to 0° , and 9 g. KOH in 60 ml. EtOH was added. The pptd. $K_2S_2O_4$ was washed with EtOH, dried, and recrystd.; it was free from other polythionates, sulfate, thiosulfate, sulfite, or chloride. $K_2S_2O_4$ was prepd. also by addn. of aq. $K_2S_2O_8$ contg. labeled sulfide S to ice-cold iodine in EtOH, or (along with trithionate) from thiosulfate and SO_2 in the presence of py. nite. To prep. $K_2S_2O_4$, 50 ml. concd. HCl was added, at -10° , to a soln. of 33 g. labeled $Na_2S_2O_3$ in 40 ml. H_2O contg. 0.7 g. As_2O_3 (as Na salt). H_2S was evolved. The

pptd. NaCl was removed, and the mixt. was stored 3-4 days at room temp., filtered, concd. in *vacuo* at 40° to 15 ml., again filtered, and 6.6 ml. AcOH and 5.4 g. KOAc (as a slurry formed by addn. of AcOH to a satd. alc. soln.) were added. The pptd. $K_2S_2O_4$, recrystd. from 0.5N HCl, was free from chloride, sulfide, sulfate, or other polythionates. In $K_2S_2O_4$ and $K_2S_4O_6$ all the activity was found in the central (sulfide) S atoms, evenly distributed except in the $K_2S_4O_6$ from thiosulfate and SO_2 , in which case the distribution was 2:1 on the two central atoms. These results suggest that the reactions involved in the preps. are: for $K_2S_2O_4$, $S_2Cl_2 + 2H_2O = S_2(OH)_2 + 2H^+ + 2Cl^-$, $S_2(OH)_2 + 2SO_3^{2-} + 2H^+ = S_2(SO_3)_2 + 2H_2O$; or (in presence of iodine as oxidizing agent) $2SSO_3^{2-} = O_2SSSSO_3^{2-} + 2e^-$; or $SSO_3^{2-} + 2H^+ + H_2O = 2S(OH)_2$, then $S(OH)_2 + 2SSO_3^{2-} + 2H^+ = S(SSO_3)_2 + H_2O$, then $S(SSO_3)_2 + SO_3^{2-} = O_2SSSSO_3^{2-} + SSO_3^{2-}$, then $O_2SSSSO_3^{2-} + 2SO_3^{2-} = 2S(SO_3)_2 + 2SSO_3^{2-}$; for $K_2S_4O_6$, $[As] + 2SSO_3^{2-} = [As]S + SO_3^{2-}$, then $[As]S + 2SSO_3^{2-} = O_2SSSSSO_3^{2-} + [As]$ ($[As]S$ an intermediate sulfide compd. whose probable nature is discussed). Also in *J. Gen. Chem. U.S.S.R.* 25, 1189-96 (1955) (Engl. translation).

Lawrence Summers

M 91

BRODSKIY, A. I.

USSR/Chemistry - Analysis methods

Card 1/1 Pub. 22 - 24/49

Authors : Brodskiy, A. I., Memb. Corresp., Acad. of Sc., USSR; and Yermenko, R. K.

Title : Study of the reaction of tetrathionates and pentathionates by means of radioactive sulfur

Periodical : Dok. AN SSSR 101/3, 487-490, Mar 21, 1955

Abstract : Experiments are described in which radioactive S was applied to the study of formation and destruction reactions of tetra- and pentathionates which were derived from initial substances containing radioactive S. In order to investigate the activity distribution in the polythionate obtained, pentathionate was decomposed with potassium cyanide. Results obtained by studying the reaction with radioactive S are listed. Eleven references: 2 USSR, 5 German, 1 Italian, 2 USA and 1 English (1870-1954). Tables.

Institution : Acad. of Sc., Ukr-SSR, The L. V. Pissarzhevskiy Inst. of Phys. Chem.

Submitted : July 30, 1954

BRODSKIY, A. I.

USSR/Geology - Geochemistry

Card 1/1 Pub. 22 - 35/52

Authors : Brodskiy, A. I., Memb. Corresp., Acad. of Sc., USSR; and Lunenok-Burnakina, V. A.

Title : Oxygen exchange between calcium carbonate and water in connection with the problem of the "Geological Thermometer"

Periodical : Dok. AN SSSR 101/4, 715-717, Apr 1, 1955

Abstract : It is shown how the difference in the isotopic composition of oxygen can serve as a means of solving numerous geochemical problems, especially in the determination of temperatures of water reservoirs during the period of deposition of calcareous stones. This measuring method, called the "Geological Thermometer", is based on the fact that it establishes the temperature dependent equilibrium ratio existing between the isotopic oxygen composition of the water and carbonate. The results obtained by the new method (like other analogous methods) were found accurate only in cases when the initial oxygen composition of the carbonate is not distorted by the exchange with the water oxygen. Eight references: 4 USSR and 4 USA (1940-1954). Table.

Institution : Acad. of Sc., Ukr SSR, The L. V. Pisarzhevskiy Inst. of Phys. Chem.

Submitted : October 30. 1954

BRODSKIY, A. I.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 22/51

Authors : Brodskiy, A. I., Memb. Corresp. of Ac. of Sc., USSR; and
Vysotskaya, N. A.

Title : Oxygen exchange in halogen acids and its mechanism

Periodical : Dok. AN SSSR 101/5, 869-871, Apr 11, 1955

Abstract : The oxygen exchange in halogen acids (perchlorate, periodate, bromate and iodate) was investigated by an ordinary method, namely by flotation measurement of the density reductions of heavy-oxygen water freed through electrolysis from excessive deuterium. The excessive density up to the point of oxygen exchange was established at 1200 gamma. In some cases the exchange was investigated by the O¹⁸ content in the oxygen determined by the mass spectroscopic method. Results obtained are analyzed. Seven references: 2 USSR, 2 USA, 2 English and 1 Japanese (1939-1953). Graph.

Institution : Acad. of Sc., Ukr SSR, The L. V. Pisarzhevskiy Inst. of Phys. Chem.

Submitted : October 30, 1954

PISARZHEVSKIY, Lev Bladimirovich, akademik; BRODSKIY, A.I., otvetstvennyy redaktor; TITKOV, B.S., redaktor izdatel'stva, ~~SP~~VACHENKO, Ye.K., tekhnicheskiiy redaktor

[The electron in chemistry; selected works] Elektron v khimii; izbrannyye trudy. Kiev, Izd-vo Akademii nauk USSR, 1956. 188 p. : (MLRA 9:9)

1. Akademiya nauk USSR (for Brodskiy)
(Electrons)

BRODSKIY, A.I.

Hydrogen exchange in solutions. Ukr. khim. zhur. 22 no.1:11-18
'56. (Hydrogen) (Solution (Chemistry)) (MLRA 9:6)